Advance Secured System for Automobiles using Intel Galileo Board

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ABSTRACT: In this paper we proposed a system which can improve the safety and security in Automobiles.An efficient automatic security system is implemented for anti-theft using an embedded system integrated with Intel Galileo generation2 Board and Finger print sensor. The system contains Finger print sensor, Global system for mobile communication (GSM), Breath alyzer sensor, pressure sensor, Temperature sensor, Ldr sensor. GSM is installed in the vehicle for sending the information to the owner. Breathalyzer sensor, pressure sensor, Temperature sensor, Ldr sensors are used to provide more safety to the owner. Suppose a unknown person is trying to access the vehicle the system will send an alert message to the owner.

KEYWORDS*:* Intel Galileo gen2, Finger print sensor, GSM, Pressure Sensor, Breathalyzer sensor.

I. INTRODUCTION

Nowadays, automobile thefts are increasing as well as production of cars in yearly world. So, vehicle theft is a universal problem. An efficient automotive security system is implemented for anti-theft using an embedded system occupied with a Finger print sensor and a Global System of Mobile.The most popular existing car security system is car alarm and has a lot disadvantages. They are;
- Siren sound cannot be heard over long distance
- Same sound (siren) for most of the cars
- Defect in Alarm
- Not 100% secure
- Cannot be heard in buildings
- Older technique

If the car is far away from the owner, at that time if someone tries to steal the car then the owner cannot be hear the siren sound.So,this paper proposes a car security system using a finger print sensor.In addition to that we proposed Some safety measures for the driver in the vehicle Such as monitoring the breath of the driver whether he/she consumed alcohol. Suppose if we tries to consume alcohol the breath alyzer place in the car steering will continuously monitor the user breath if it is beyond the threshold limit the engine will gradually stopped. The driver need to wear the seat belt to start the vehicle, if tries to remove the seat belt while driving and that time also the vehicle will be stopped. Some important parameters of the vehicle should be monitored. They are;
- Pressure applied to the break

- Temperature of the vehicle(engine)

The above said alcohol detection is also implemented in two wheelers also. Two condition need to satisfy in order to start the two wheeler. First the driver must wear the helmet thought driving and also he/she should not consumed alcohol. A breath analyzer sensor is placed in the helmet to continuouslymonitor the drivers breath.

A Brief Review

In many previous research works, the authors have givensome analytical view of the circuit used in the various projects, while in some other research GPS is commonly tousedto locate the vehicles and also to stop the vehicle if stolen**.**A number of developments have taken place in safety and security systems for vehicles and some of the relevant ones are as follows.

Suhas S.Kibile et al. [1] introduce "Automotive Security and Safety System Using ARM Microcontroller". This paper describes how an ARM technology will be sued to improve the security and safety for a vehicle. He also used the same finger print sensor to provide the security for the vehicle. But he did not mention how the third person who is known to the owner will access the car if the owner is not nearby the vehicle.

HninPwint Han et al.[2] presents "Advanced Car Security System UsingGSM".The author suggest a system which will send alarm signal using GSM.This system just sends a message to the owner suppose if an a person tries to open the door.

G. Divya et al. [3] suggest "Advanced Vehicle Security System with Theft Control and Accident Notification using GSM and GPS Module". The main advantage of the system suggest by the author was, we can continuously track the vehicle with help of our phone.

Ahmed Shoeb Al Hasan et al.[4] suggest"Security Threats in Vehicular Ad Hoc Networks" This system will provides smart transport system that provide road security and reduce traffic jam through automobile to automobile and automobile to roadside communication.

Chaitali N. Surkar et al.[5] presents "Raspberry Pi-2 Based Anti-Theft System for Car Logo"
In this paper the author present a solution on how to protect the car logo with affordable cost. Here, he make an attempt to develop a systembased on raspberry pi technology. In this system when someone is trying to steal the car logo it alerts the car owner when he is at nearest distance as well as when he is not nearer to the car..The author also used camera to capture the thief.
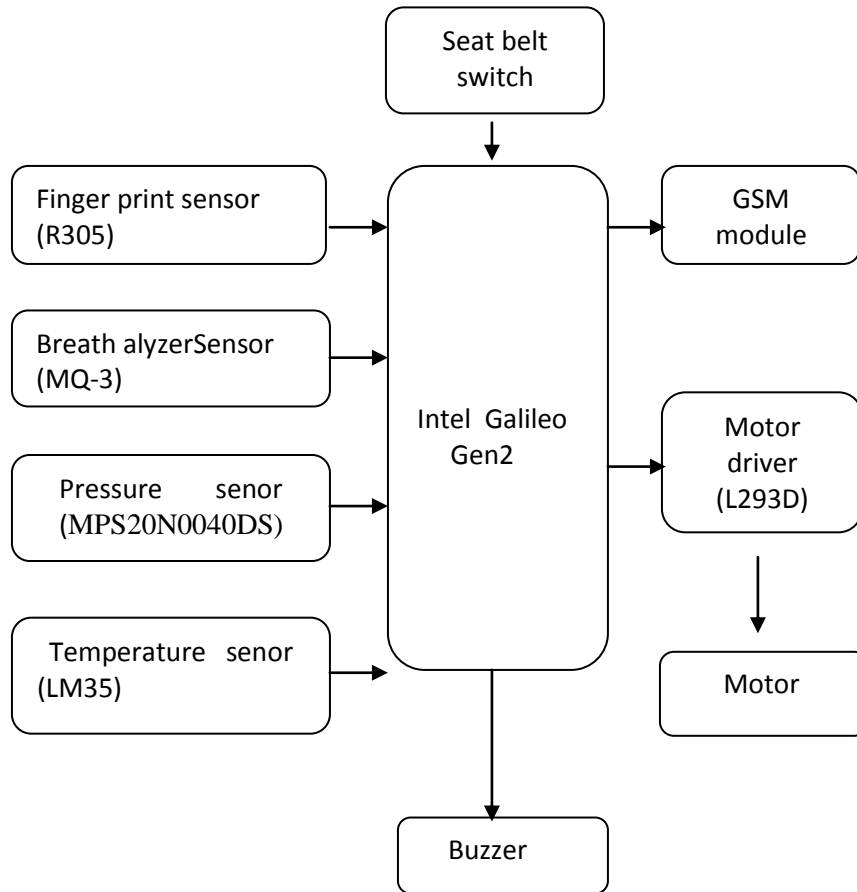
Fig.1. Car safety and security system

Finger Print Sensor (R305)

This is an optical biometric fingerprint reader/sensor (R305) module with TTL UART interface for direct connections to a microcontroller UART. The user can store the finger print data in the module and can configure it in 1:1 or 1: N mode for identifying the person. This module can directly interface with any 3.3V or 5V microcontrollers, but a suitable level converter/serial adapter is required for interfacing with the serial port of a PC.
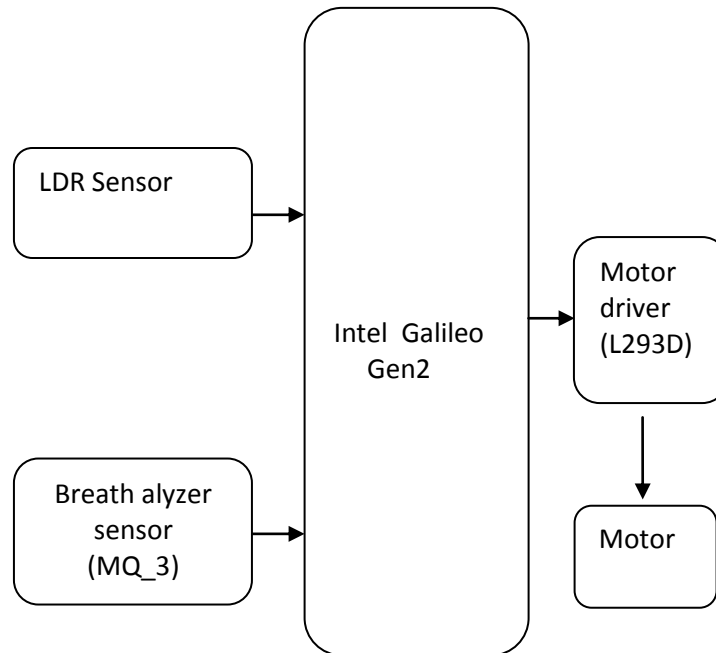
Fig.2. Two wheeler safety system

Features

- Integrated image collecting and algorithm chip together, ALL-in-One
- Fingerprint reader can conduct secondary development, can be embedded into a variety of end products
- Low power consumption, low cost, small size, excellent performance
- precise module manufacturing techniques
- Good image processing capabilities, can successfully capture image up to resolution 500 dpi

II. METHODOLOGY

The Finger print module itself does all complex tasks behind reading and identifying the fingerprints with an on-board optical sensor and fingerprint algorithm. First you need to enroll the particular owner's finger print. The database of prints can even be downloaded from the unit and distributed to other modules. We can also retrieve the image of a fingerprint and even pull raw images from the optical sensor.

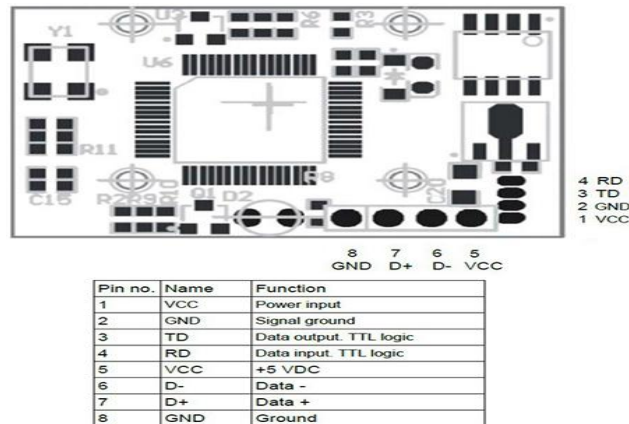| Pin no.	Name	Function
1	VCC	Power input
2	GND	Signal ground
3	TD	Data output. TTL logic
4	RD	Data input. TTL logic
5	VCC	+5 VDC
6	D-	Data -
7	D+	Data +
8	GND	Ground

Fig.3.Finger print sensor pin diagram

If we done a survey *SuhasS.Kibile[1]*proposed onevehicle security systemwith use of finger print sensor. But one disadvantage in his system only the owner of the vehicle will be able to access the vehicle. In some situation a person known to the owner needs to access theVehicle but the owner is not near the vehicle. In that situation we proposed a system, in which the owner can able to give permission to the vehicle sending a secret message to the vehicle.

All the authors proposed their system that will be used for only four wheelers.ourproject will ensure full safety the driver who are using two wheelers.
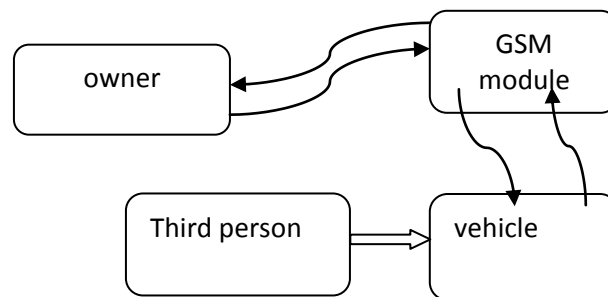

Fig.4. Flow of security process in car

Flow chart for car process
The driver will first place his finger over the finger print module. If the finger print of the driver is matched with the that is already stored in the finger print module then the driver is allowed for the next phase is it is not matched then an alert message will be send to the authorized person .If the driver is known to the owner the owner will send an secret message to the vehicle by allowing him to move to the next phase. In the second phase the drivers breath will be monitored if the limit exceeds then he cannot able to start the vehicle. If the driver doesn't consumed alcohol then he will allowed for the third phase. In the third phase the driver must completely wear the seatbelt to start the vehicle. The third and second phase involves continuous monitoring, suppose if the driver tries to consume alcohol while driving and also if he/she tries to remove the seat belt the vehicle speed will be gradually slow down and it stops running

For safety the system will also monitor the pressure and temperature of the vehicle if any parameter gets increased the vehicle will gradually stops.

III. PERFORMANCE ANALYSIS

The performance of each and every module feature has been given, starting with the finger print sensor.

Fig.5. Finger print capture

We already mentioned that inorder to monitor the pressure and temperature of the vehicle, we used Temperature and pressure sensors. Suppose if the pressure applied to the break or the temperature inside the vehicle exceeds beyond an threshold value. A malfunction message will be send to the mechanic and the vehicle will gradually slows down.
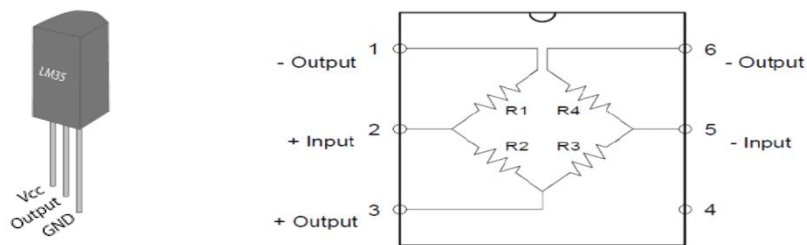

Fig.6. Pin diagram for pressure and temperature sensor

This type of pressure sensor consists of a micro-machined silicon diaphragm with piezoresistive strain gauges diffused into it, fused to silicon or glass backplate.The resistors have a value of approx. 3.5 kΩ. Pressure induced strain increases the value of the radial resistors (r), and decreases the value of the resistors (t) transverse to the radius. This resistance change can be high as 30%.The resistors are connected as a Wheatstone bridge show in figure, the output of which is directly proportional to the pressure.
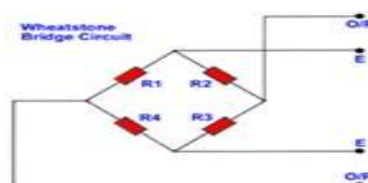

Fig.7.Wheatstone bridge principle

For two wheelers both the alcohol and ldr sensors are placed on the helmet.

Fig.8.Helmet for two wheelers

Table.1. Sensors and its range for transmission

Sensors Used	Range of Transmission	Operating Voltage(v)
Finger print sensor	Upto 250 finger print can be stored	3.6-6
Breath alyzer sensor	0.04-4mg/l alcohol	5
Pressure sensor	0-5 .8 psi	5
Temperature sensor	55°C to +125°C	4

IV. CONCLUSION

We need a very good security system for automobiles to reduce higher level of thefts. This paper provides an appropriate method of designing and assembling low cost and essential theft control system for automobile using GSM and biometrics implemented on intel galileo gen 2 board. This system provides reliable security for cars. By installing this system in cars and two wheelers a unknown person cannot start the car and also provides more safety to the driver. In future, Cameras and IoT can be incorporated into the system to identify the person and also GPS system can be added tokeep the track of the vehicle that is being stolen. It also assures more safety to the driver.

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